

PC printer port programs PROMs

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Fig 1 shows a 2817 programmer you can build. A PC's printer port controls the programmer. The printer port has eight data-output lines (pins 2 to 9), four control lines (pins 1, 14, 16, and 17), and five input lines (pins 10, 11, 12, 13, and 15). The data lines send out the 2817's address and program data. The control lines control the programming sequence. After programming is completed, the PC reads

the programmed data back in through its input port for verification.

The Turbo C program in Listing 1 sends the 2817's program, contained in a binary file named p2817.dat, to the programmer in this sequence: 8 bits of data, followed by the low 8 bits of the address, and finally by the high 3 bits of the address (which the programmer latches into IC₁, IC₂, and IC₃). The printer port's

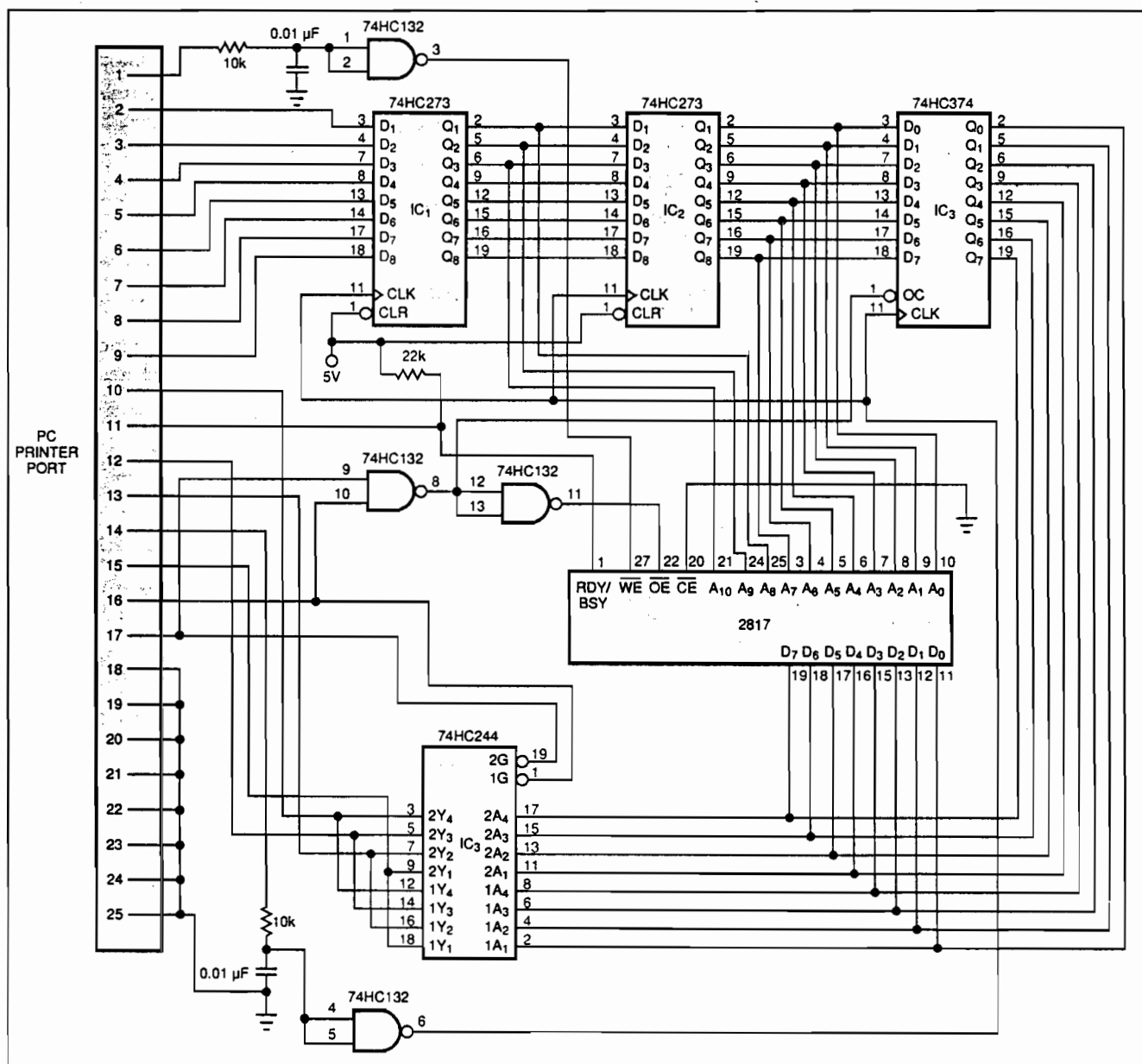


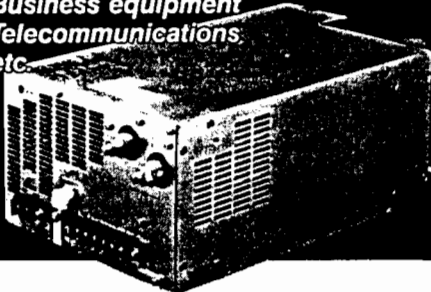
Fig 1—A PC's printer port and a simple Turbo C program control this 2817 programmer.

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pin 14 clocks these 19 bits in. Then the PC polls the 2817's RDY/BUSY line via printer-port pin 11, waiting for the chance to send the next data-address combination. After programming all 2 kbytes of the PROM, the PC will read the 2817 using printer-port pins 16 and 17. A copy of the program is available on the EDN BBS. EDN BBS /DI_SIG #1146

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Listing 1—2817 programmer control program

```
#include <stdio.h>

#define CONTROL_PORT 0x37a /* printer control port address */
#define IN_PORT 0x379 /* printer input port address */
#define OUT_PORT 0x378 /* printer output port address */

main()
{
    int buffer, tp, date(2048), i, add_h, add_l, readin_1, readin_2, read_data;
    FILE *stream;
    outportb(CONTROL_PORT, 0x07); /* printer input port address */
    if ((stream = fopen("p2817.dat", "rb")) == NULL)
    {
        fprintf(stderr, "Cannot open input file.\n");
        return 1;
    }
    fseek(stream, 0, 0);
    for (i=0; i<2048; i++)
    {
        buffer=0;
        fread(&buffer, 1, 1, stream);
        data[i]=buffer;
    }
    fclose(stream);
    for (i=0; i<2048; i++)
    {
        add_h=i/256;
        add_l=i-add_h*256;
        outportb(OUT_PORT, data[i]); /* send out data */
        outportb(CONTROL_PORT, 0x05);
        delay(1);
        outportb(CONTROL_PORT, 0x07);
        delay(1);
        outportb(OUT_PORT, add_l); /* send out low address */
        outportb(CONTROL_PORT, 0x05);
        delay(1);
        outportb(CONTROL_PORT, 0x07);
        delay(1);
        outportb(OUT_PORT, add_h); /* send out high address */
        outportb(CONTROL_PORT, 0x05);
        delay(1);
        outportb(CONTROL_PORT, 0x07);
        delay(1);
        outportb(CONTROL_PORT, 0x06); /* write address into 2817 */
        delay(1);
        outportb(CONTROL_PORT, 0x07); /* write data into 2817 */
        do {
            delay(1);
        } while ((inportb(IN_PORT) & 0x80 != 0x00); /* wait */
    }
    for (i=0; i<2048; i++) /* check programmed data */
    {
        add_h=i/256;
        add_l=i-add_h*256;
        outportb(OUT_PORT, add_l); /* send out low address */
        outportb(CONTROL_PORT, 0x05);
        delay(1);
        outportb(CONTROL_PORT, 0x07);
        delay(1);
        outportb(OUT_PORT, add_h); /* send out high address */
        outportb(CONTROL_PORT, 0x05);
        delay(1);
        outportb(CONTROL_PORT, 0x07);
        delay(1);
        readin_1=inportb(IN_PORT) & 0x78; /* read low 4-bit data */
        outportb(CONTROL_PORT, 0x07);
        delay(1);
        readin_2=inportb(IN_PORT) & 0x78; /* read high 4-bit data */
        outportb(CONTROL_PORT, 0x07);
        delay(1);
        read_data=readin_1/8 + readin_2*2;
        if (read_data != data[i])
        {
            fprintf(stderr, "Program error.\n");
            return 1;
        }
    }
    return 0;
}
```